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MINERALOGY AND PETROGRAPHY.[1]

Petrographical News.—Renard, in the course of his work on the rocks collected by the *Challenger* in 1874, has found some interesting material among the specimens collected from the volcanic islands in the Polynesian group. Most of the larger islands he thinks will be found to consist of crystalline schists, which the ancient and younger lavas have in turn overflowed and concealed. As evidence of the fact that some of the rocks found in these islands are of pre-Tertiary age, Renard describes[2] two slides from Cebu, one of the Phillippine group. One of these consists of porphyritic crystals of olivine, Baveno twins of Bytownite or labradorite and broken crystals of augite in a microcrystalline ground-mass of plagioclase, augite and viridite, possessing a well-marked flow structure. As all the constituents are much altered, with the production of considerable epidote, the author supposes this rock to be an olivine diabase or a melaphyre. Under the influence of the gaseous emanations from fumaroles the plagioclase is changed into a mixture of albite, saussurite and epidote, the bisilicates into chlorite and pyrite. Gypsum associated with pyrite is a frequent result of the action of sulphuric acid vapors on both older and young lavas. On the Island Malanipa serpentine occurs. This is cut in all directions by veins of chalcedony, and is obviously the result of the decomposition of peridotite. Quite a number of slides of specimens gathered from the Moluccas,[3] Banda[4] and the Fiji[5] islands were examined. They prove that the predominating rock on all these islands is augite andesite. On the Island Ternate,[3] which consists almost entirely of a single volcanic peak, in addition to the andesite there occurs basalt. The former rock is composed of a glassy base with numerous devitrificative products and porphyritic crystals of zonal labradorite, twinned, pleochroic augite with an extinction of from 44°–50°, and magnetite. In the augite the pleochroism is $\underset{\text{reddish-yellow}}{a + b} > \underset{\text{greenish}}{c}$. By the action of the volcanic gases the basalt is almost completely changed into a quartziferous aggregate in which are occasional grains of augite and plagioclase, and very rarely the remains of olivine. In an altered rock from Banda[4] the plagioclase crystals are filled with cracks and fissures, into which a colorless isotropic substance has penetrated, in many instances replacing entirely the feldspar. A chemical analysis of the fresh unaltered andesite from this island shows it to contain from fifty-six to fifty-nine per cent of silica, while the altered variety contains as high as ninety per cent.

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[1] Edited by W. S. Bayley, Johns Hopkins University, Baltimore, Md.

[2] Bulletin de l'Acad. Roy. de Belgique, III, 2, p. 95.

[3] Ib., III, 2, p. 105.

[4] Ib., III, 2, p. 112.

[5] Ib., III, 2, p. 156.

Opal replaces the original constituents of the rock, first replacing the feldspar, then the augite and finally the glass base. Occasionally this silica takes the form of tridymite. Near the port of Kantavu, on one of the Fiji[1] islands, quite a number of hornblende andesites were found. In a yellowish glassy base, containing numerous microlites of feldspar, augite and grains of magnetite, large porphyritic crystals of labradorite, hornblende and biotite occur. The hornblende often possesses the two pinacoids well developed. In some cases this mineral is surrounded by a rim of small, colorless or very light-green augite crystals, arranged with their long axis parallel to the long axis of the hornblende. In other cases the hornblende passes over into a perfect pseudomorph of brown biotite, which can be distinguished from the original biotite by the fact that the hexagonal sections of the secondary mineral are composed of tiny fibers lying parallel to one of the pinacoids of the hornblende from which it was derived, while those of the original biotite appear homogeneous.——Fouqué reports[2] that the rock of Gamboa, on the line of the Panama canal, is an augitic labradorite containing hornblende. The porphyritic crystals of labradorite, augite and magnetite occur in a microlitic base, which has been transformed in greater part into chlorite.——The rocks collected during the cruise of the *Talisman*, in 1883, have been given to Michel Lévy for examination. Two hundred and fifty slides of specimens collected between the depths of 4000–5000 meters have been examined. By far the largest number of these are of rocks of the "old metamorphic series."——The igneous rocks of the ridge known as Stanner rock, near old Radnor, Shropshire, England, are stated by Cole[3] to consist of an acid series intrusive in a more basic series. The most highly crystalline member of the former is a "pale pink-grey pegmatite," passing through a well-defined graphic granite into a micropegmatite form. The less crystalline members of the acid series are felsites with well-developed spherulitic structure. Corroded quartzes, surrounded by the the "quartz globulaire" of Fouqué and Lévy, were observed in most of these felsites. The more basic series is composed of diabases, diorites and rocks intermediate between these, with a few in which the author thinks he has found evidence of previously existing olivine.——Chrustschoff has just published[4] an interesting article on "pyrogeous quartz and tridymite." Inclusions of granite and quartz in the basalt of Striegan were partially dissolved, and around them a secondary crystallization of quartz took place. These new crystals are frequently bounded by crystal planes. They enclose glass areas which are derived from original inclusions, and contain also fluid inclusions with movable bubbles. Tridymite is much more rare under these conditions than quartz. It is usually found lining cavities around the periphery of glass particles or veins, and is generally free from inclusions. The granitic feldspar is likewise in many cases surrounded by a rim of "neogenous" feldspar, which frequently builds around the original irregular fragment a completely developed crystal. The newly-formed feldspar is much less opaque than that from which it was derived, and contains fewer inclusions. Among those that occur are little fluid cavities containing movable bubbles. A most instructive portion of the paper is that which treats of the experiments which were undertaken by the author to explain the origin of the secondary fluid inclusions, and to find the conditions under which the silica separated out in crystal form.——Pöhlman[1] has recently described biotite-gneiss, quartzite, olivine-kersantite and nepheline-basalt from the northern part of Paraguay. The olivine-kersantite contains, in a dark gray ground-mass, large crystals of biotite (meroxan), perfectly fresh augite and flesh-colored pseudomorphs of olivine. These pseudomorphs consist of serpentine, very pleochroic bunches of a micaceous mineral, carbonates and iron oxides.——According to Carl Ochsenius,[2] the blue color of much of the Strassfurt salt is not due to sulphur, but is merely an optical effect.

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[1] Bulletin de l'Acad. Roy. de Belgique, III, 2, p. 156.

[2] Comptes Rendus, CII, No. 14, p. 793.

[3] Geological Magazine, May, 1886, p. 219.

[4] Mineralogische und Petrographische Mittheilungen, VII, p. 295.

MINERALOGICAL NEWS.—Emmonsite, a new mineral from near Tombstone, Arizona, has been described by W. F. Hillebrand.[3] It is of a yellowish-green color, translucent, and occurs in crystalline scales and patches in a brownish gangue composed of lead carbonate, quartz and a brown substance containing iron, tellurium and water. The mineral is probably monoclinic, with a good cleavage parallel to the clino-pinacoid. Cleavage pieces show two other directions of imperfect cleavage nearly at right angles to each other. Against one of these the extinction is 8°–12°. Pleochroism very slight. Specific gravity about 5. After allowing for impurities the mean of four analyses was as follows:

Te	Se	Fe	H_2O
58.75	0.53	14.29	above 3.28

It is most probably a hydrated ferric telluride.——Twins of cinnabar[4] have been found in the recently discovered ore deposits in the neighborhood of Bachmut, Ekaternioslaw, South Russia. The crystals are inter-penetration twins with the base the twinning plane and the twinning axis the vertical axis. The planes on each crystal are R, 2R, and the trapezohedron $\frac{2P\frac{2}{3}}{4}$. When the tetartohedral plane is on the right edge of an upper rhombohedral face the crystal is dextro-rotatory.——The jeffersonite of Franklin, N. J., has been investigated crystallographically and chemically by Kloos, of Stuttgart.[1] In the prismatic zone only $\infty P \grave{\infty}$ and ∞P were found. The crystals were terminated by $0P$, $\pm P$, $2P\grave{\infty}$ and $3P\grave{3}$. The pleochroism is strong $\mathfrak{a}$ = honey-yellow, $\mathfrak{b}$ = yellow-green, $\mathfrak{c}$ = blue-green. Absorption $\mathfrak{c} > \mathfrak{a}$. Sections parallel to the clino-pinacoid gave an extinction of 17° 15′ against the vertical axis. Specific gravity 3.352. A chemical analysis yielded:

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[1] Neues Jahrbuch für Min., etc., 1886, I, p. 244.

[2] Ib., p. 177.

[3] Proceedings Colorado Scientific Society, Vol. II, Pt. I, 1885, p. 1.

[4] Ischermak. Miner. u. Petrogr. Mitth., VII, p. 361.

SiO_2	TiO_2	Al_2O_3	Cr_2O_3	Fe_2O_3	FeO	MnO	ZnO
39.59	1.76	11.20	0.13	5.97	11.31	3.07	0.53

MgO	CaO	Na_2O	K_2O	H_2O	total
8.42	12.85	3.31	1.95	1.02	101.11

In the light of this result the author does not feel justified in assigning to this mineral any definite constitution. The small amount of MnO would seem to indicate that the mineral under investigation is not a true jeffersonite.——Brauns[2] has discovered a new plane $\frac{17}{20} P \bar{\infty}$ in manganite from near Oberstein a. d. Nahe. ——In the clefts of a piece of soapstone from Göpfersgrün, near Wunsiedel, Sandberger[3] has found uranite and torbernite in little quadratic tables. Pseudomorphs of arsenio-siderite after siderite from Bulach in Würtemberg and greenockite from the clefts of zincblende from Brilon, Westphalia, and Neu-Sinka, in Siebenbürgen, were also found and examined by the same investigator.

BOTANY.[4]

FIGURES OF SOME AMERICAN CONIFERS.—Dr. M. T. Masters read a paper entitled "Contributions to the history of certain species of Conifers" before the Linnean Society, in January of the present year, in which some American species are critically discussed. They are as follows, viz:

Abies amabilis Forbes. This is accompanied with a nearly full-sized figure of the cone, a photo-engraving of a sterile branch, with half a dozen enlarged figures of leaves, leaf-sections, bracts, scales and seeds.

Abies grandis Lindley. A large double plate showing five cones, with figures showing details of leaf and cone structure, illustrate this species. The variety *lowiana* (= *Picea lowiana* Gordon, *Picea parsonsiana* Barron, *Abies lowiana* McNab) is described and figured. A second variety, *pallida*, is doubtfully separated. Its leaves are "of unequal length, flat, and pale in color."

Abies concolor Lindley. Figures of the cone, foliage, leaf-structure, bracts and scales illustrate this species.

Abies subalpina Engelm. Full illustrations accompany the description of this species.

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[1] Neues Jahrb. für Min., etc., 1886, I, p. 211.

[2] Ib., p. 252.

[3] Ib., p. 250.

[4] Edited by Professor CHARLES E. BESSEY, Lincoln, Nebraska.